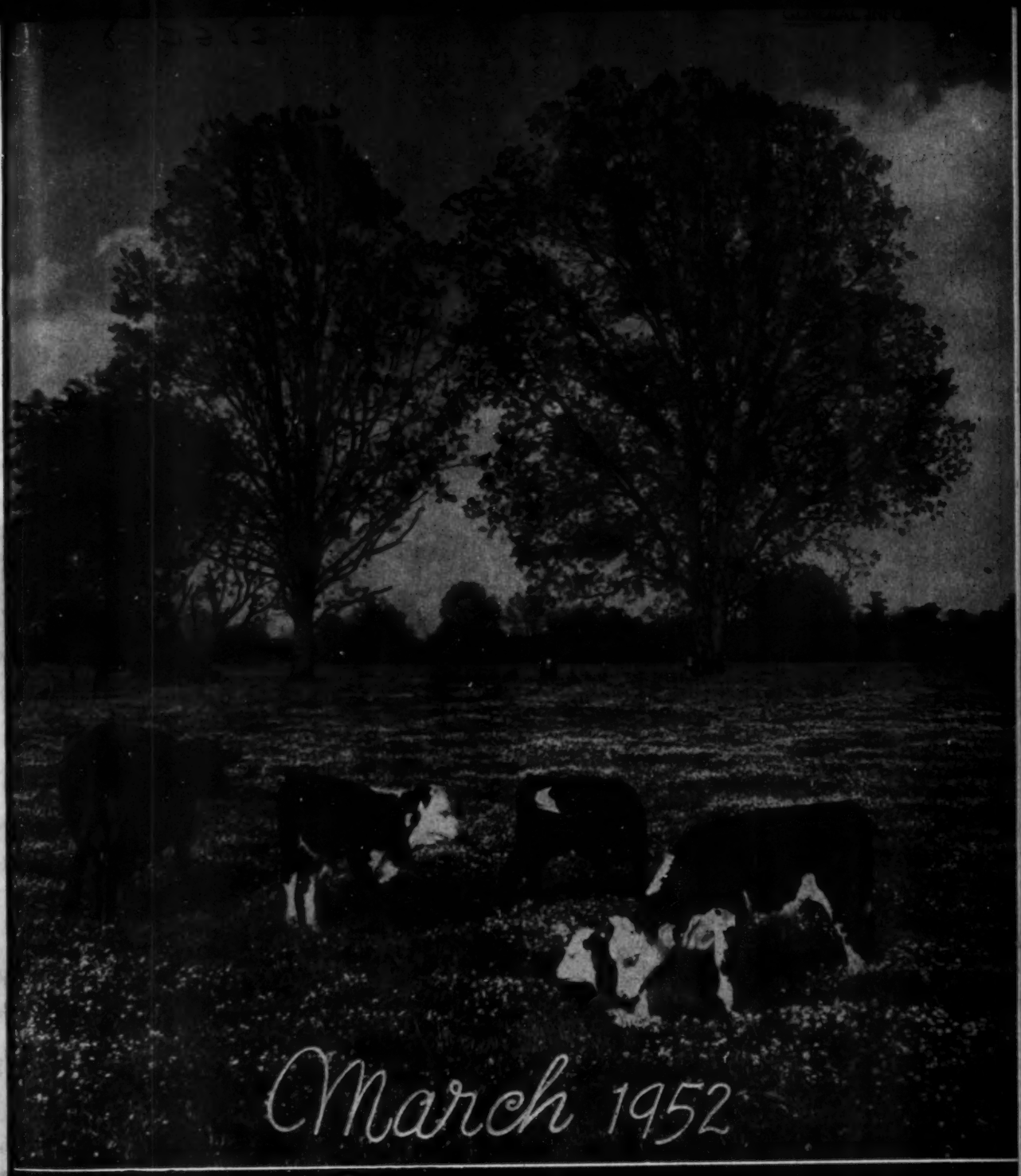

March 1952

SOIL CONSERVATION

OFFICIAL ORGAN OF THE SOIL CONSERVATION SERVICE

SOIL CONSERVATION

MARCH—1952
VOL. XVII—NO. 8

CHARLES F. BRANNAN
SECRETARY OF AGRICULTURE

ROBERT M. SALTER
CHIEF, SOIL CONSERVATION SERVICE

ISSUED BY SOIL CONSERVATION SERVICE, U. S. DEPARTMENT OF AGRICULTURE
WASHINGTON, D. C.

☆ THIS MONTH ☆

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WELLINGTON BRINK
Editor
Art Work by
W. HOWARD MARTIN

SOIL CONSERVATION is published by direction of the Secretary of Agriculture as administrative information required for proper transaction of the public business, under approval (August 6, 1951) of the Director of the Budget. SOIL CONSERVATION supplies information for workers of the Department of Agriculture and others engaged in soil conservation.

15 CENTS PER COPY **$1.25 PER YEAR**
FOREIGN—$1.75 PER YEAR
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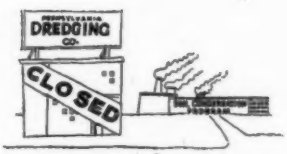

LESS MATERIAL DEPOSITED. — Pennsylvania companies that dredge the bottom of the Susquehanna River for coal, sand, and gravel are getting down to the bottom of the stream bed.

"Before many more years pass," says Charles G. Downey, one of the principal river operators for a half century, "the business may be a thing of the past."

An important factor in this decline, he says, is "improved methods in soil conservation, such as plowing, planting, and cultivating to check erosion." Other factors are improved methods in reclaiming coal at the mines and the State's clean-streams program, which aims at eliminating the dumping of waste materials into streams.

Since the early thirties, according to Downey, the annual tonnage of coal, sand, and gravel removed by his company from the river bed in the Harrisburg area has shrunk from 100,000 tons to 15,000 to 20,000 tons.

FRONT COVER. — This improved pasture in Louisiana is part of a 600-acre stretch of Dallisgrass, Bermuda-grass, and White Dutch clover. Measures included clearing away of brush after establishment of a drainage system, and fertilizing with 300 pounds per acre of 20 percent superphosphate.

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Conservation, and Goals

The 1952 production goals for American agriculture challenge us to make our land strong. This we must do not only for today but also for next year and the years to come. Our task is to bring to bear every resource of modern science and management, to the end that our farms and ranches will be safe and permanently productive. Soil and water conservation offers some of the most important of these modern scientific and management methods.

We know already that conservation farming has an immediate and striking effect in increasing yields. We know from experience that the output of crops, meats, and fibers goes up when we put the land to its proper work. We know that we have the basic knowledge, the tested techniques, and the right methods to enable us to appraise the capabilities of every acre in every farm, to provide sound conservation planning, and to apply needed practices.

To this knowledge let us now add a full measure of determination, ingenuity, teamwork, and devotion to the common cause.

Robt M Salter

THE MOST CENTRALLY LOCATED FARM IN THE UNITED STATES

By LUTHER E. HAMILTON

THE exact center of population of the United States is in a grassed waterway on the farm of Carl Snider, in the Richland County Soil Conservation District, Dundas, Ill.

Except for Snider's careful conservation work, the symbolic stake might have been driven last October in a gully, where it would have had small chance of remaining upright very long. The United States Census Bureau is fussy about the precise location of the imaginary pivot on which population balances, or on which it would balance if we all weighed exactly the same.

Carl Snider is a hard-working, intelligent, suntanned American who fits into the center of population exceptionally well. He is 33 years old, the youngest of five brothers, all of whom have farms in the community. Carl and June have two sons: Don, 5 years, and John, 2. They bought their 150-acre farm 5 years ago and they're building up the soil while they pay for it. The north part is so flat that surface drainage ditches were needed in some places to take off standing water. The south half, mostly Class III land, must be protected from sheet and gully erosion.

Carl became interested in erosion- and water-control shortly after he bought the farm. With the help of Luther Hamilton, farm planner assigned to the Richland County Soil Conservation District, he worked out a conservation plan that was approved by the district directors in 1948. The surface-drainage system was constructed the same year. When one of the ditches began to scour and work back into the drainage system, it was necessary to change it to a grass waterway. This is now famous as the waterway in which the official center of population will remain until after the 1960 census. It was constructed under the supervision of Walter Zimmerle, conservation aid, in August 1951. It was fertilized and seeded to Alta fescue, timothy, and redtop.

Note.—The author is a farm planner, Soil Conservation Service, Olney, Ill.

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"X" marks the spot. Center of population is at edge of waterway seeded to oats, fescue, redtop, and timothy. At left, Luther E. Hamilton, work unit conservationist, talks to Carl Snider.

Posed in front of grandstand at celebration: Carl Snider and 2-year-old John; Hon. Charles Sawyer, Secretary of Commerce; 5-year-old Don; Mrs. Snider.

Snider and Zimmerle could hardly have planned any better if their intention had been to prepare the spot for the fame that was to come to it in a few weeks. By October there was a good cover of grass.

Since Carl's conservation plan was developed, he has built 3,470 feet of open drainage ditches and 2,500 feet of grass waterways. He has also built a pond for watering livestock. On his list still ahead are 1,000 feet of multiflora rose and other plantings around the pond, and 50 acres of pasture improvement. He follows the 4-year rotation recommended for his area: corn, soybeans, wheat, clover and grass. His seedings include 8 pounds of sweetclover, 5 pounds of lespedeza, and 3 pounds of redtop. Carl is interested in adding humus to his soil. He applied 400 pounds of potash and 300 pounds of 4-8-12 fertilizer with his wheat and fall seedings. The directors of the Richland County Soil Conservation District considered his work outstanding enough to merit a visit on their annual fall inspection tour.

Richland County was part of a four-county soil conservation district until it was organized on a county basis in 1945. When District Chairman Frank Wade was asked to comment on the incident that put Richland County in the Nation's newspaper headlines, he said: "This brings home to us the fact that our population is growing every day, while too much of our good land is being damaged by erosion. It is time to take the necessary steps to insure that our future population will have enough food."

Carl Snider went about his daily work unimpressed by the popping of flash bulbs, the stream of autos that flowed past his farm, and the celebration held to commemorate the event. Center of population or no center of population, the soybeans had to be harvested and the livestock fed, along with all of the daily work that makes up the life of a conservation farmer.

DISTRICT PROFILE

BROWN of PENNSYLVANIA

Frank Brown, Sr., has come a long way in 5 years. Starting with a rented 10-cow farm of eroded hillside and swampland, and relying mainly on team, corn, and plow, he now owns a complete grassland conservation farm and is the 1951 State winner of the PMA-sponsored Green Pastures Contest.

Frank, at 31, is the youngest director of the Wyoming County Soil Conservation District board, and the first president of the Wyoming County Young Farmers Association.

Raised on a Wyoming County farm, Frank drifted from farm life after graduation from Tunkhannock High School. He worked as a car salesman and welder before World War II. Immediately after his discharge in February 1946, he rented a farm and enrolled in institutional on-the-farm training of the veterans program. Each year he took full advantage of PMA payments for lime and fertilizer, and used considerably more than the PMA program provided. He purchased the 93-acre farm he was renting and started building up his herd.

With the help of Stratton B. Stevens, veterans instructor, Frank began to develop his pasture and started drainage work on the swampland. He switched from team to tractor, and put up grass silage along with corn. Having the foresight to see the need for erosion control and water conservation, Frank worked with the Young Farmers Association to get a soil conservation district established in Wyoming County. After more than a year of effort the group was successful and Frank was named by the county commissioners as a member of the new district's board of directors. He was among the first in the county to develop a conservation plan in cooperation with his district.

Frank Brown and registered Guernsey around which he has built his herd.

Frank's prize-winning pastures are long narrow strips of Ladino-orchardgrass, leading off a lane from the exercise lot of bluegrass. His 30 head of registered golden Guernsey milkers had ample lush pasture from 23 acres this year, the driest year in the memory of many local people. Four acres are bluegrass, the remainder improved seeded pasture. In addition to furnishing adequate pasturage, much of the first growth went into the silo. Seedings are now made by breaking up the old sod with a field cultivator instead of a plow. A disk is then used and the seedings made in the dried-up sod mulch. All pastures are mowed at least six times per year and top-dressed annually. A diversion terrace was built to protect the pastures from washing and silting. A water outlet was constructed and the drainage system enlarged and lowered. A pond for stock water is at present under construction, and steep odd areas were planted to trees. This year, for the first time, the open farm land is all in grass. The meadows are used for hay and silage, and are not pastured.

Many are the visitors to the farm. Frank, Sr., and his 12-year-old-son, Frank, Jr., together explain the program that is working so well. The son is already a future guardian of America's most precious natural resource—her soil.

—STRATTON STEVENS AND D. T. DINSMORE

IMPRESSIVE RISE IN INCOME.—While on a tour held in the Thornapple-Grand (Mich.) Soil Conservation District to the farm of an FHA cooperator, the FHA county supervisor had some interesting information to present. In making an appraisal of the benefits of soil conservation, he calculated that the increased income compounded for a period of 40 years would amount to over $55,000. These figures were not questioned by the group, as evidences of the increase in production were apparent to all.

WE PUT THE EMPHASIS ON GOOD LAND USE

C. E. Humphries gets twofold returns: pecans and beef. He is a pioneer in beef production in the Delta, and a member of the agricultural committee of the United States Chamber of Commerce.

D. B. Pitlow, in the Leflore district, finds that improved pasture and sheep pay on poorly drained gumbo land not suited to cotton. Land Use Emphasis Week stressed improved pastures as a part of conservation farming.

FEW events in our Mississippi community have received such widespread acclaim and cooperation as our Land Use Emphasis Week last summer. The results lead us to recommend that similar programs be adopted in other places.

With a series of sermons, tours, demonstrations, radio programs, speeches, and a barbecue luncheon, we joined in a great cooperative effort to arouse more appreciation for the basic importance of good land use in the Leflore County Soil Conservation District, which is wholly within the Yazoo - Mississippi Valley, and in the Big Sand Creek Soil Conservation District, which lies partly within that valley and partly in the bordering bluff area.

The program was sponsored by the Greenwood Chamber of Commerce and the Carroll County Chamber of Commerce through their Soil Conservation Committees. These organizations actually had to do little more than lay plans for the event, and then guide the enthusiastic efforts of many other organizations and interested individuals in bringing the week of events to a successful conclusion. The Big Sand Creek Soil Conservation District is in Carroll County.

The two districts have an integrated problem in floods and siltation that results from the rapid run-

By J. H. PEEBLES

President, Bank of Commerce, Greenwood, Miss.

Control work has started on this gully in the Big Sand Creek district. A desilting basin at the mouth of the gully holds back much of the eroding soil, while kudzu gains a protecting foothold on the raw banks.

This fine crop of young trees is holding the soil on G. P. Ritchey's farm in the Big Sand Creek district. Ritchey calls them his "old-age pension."

off of rain water falling in the hills of Carroll County. This rapid runoff is hastened by the lack of vegetation on many thousands of acres of eroded and gullied lands. The siltation is the result of erosion of fields, gullies, roadsides, and stream banks.

The Leflore County Soil Conservation District faces also the problem of getting the heavier clay soils put to the growing of legumes and grasses for pasture, seed, and hay, or put to other good uses. It is a matter of great importance to the people and to the soils of both counties that good land use be practiced to keep more of the rain water where it falls, to protect the land from erosion, to realize the best income from the fields and the forests, and to prevent floods and siltation on the lower lands.

With these fundamental considerations before them, the two chambers of commerce planned this Land Use Emphasis Week and laid out a program to include sermons on good land husbandry in all of the churches of the two counties, a day of publicity to precede the other activities (when newspapers, radio, and public posters were used to keep readers and listeners reminded), and a day's tour in Carroll County to demonstrate outstanding achievements in good land use. The tour was well attended and included a fine address by T. B. Fatherree, State director of the Farmers Home Administration, who talked from the bottom of a gully on the C. E. Hoge farm, which was adopted for a project of land rehabilitation. This was followed by a midday lunch at the farm of Sidney Bussey, which was supplied by the Leflore Bank and Trust Co. of Greenwood and the Peoples Bank and Trust Co. of North Carrollton.

An afternoon tour in Leflore County gave the opportunity of observing some excellent pasture developments and livestock growing on Delta soils, as well as some fine examples of row arrangement and drainage by the use of W-ditches. A Delta tour on the following day was interrupted by rain, so the principal speaker, Sam Coker, president of the Delta Council, was heard in the courthouse at Greenwood. The introductory remarks by Hugh L. Gary, president of Wildwood Plantation, were inspired by his deep feeling for the fundamental need for safe land usage and were a sermon in themselves.

The final day was featured by a barbecue lunch, attended by more than 600, and an address by T. S.

Buie, Southeastern regional director of the Soil Conservation Service, Spartanburg, S. C., who remarked on the progress of diversification and good land use that he had been able to witness since beginning his visits to this section.

The Soil Conservation Service supplied enlarged photographs of a selected number of pictures taken in the Leflore district. These were displayed in many show windows and public offices throughout Greenwood, where they excited much favorable comment. The *Morning Star* of Greenwood published an extra section of 16 pages, replete with photographs of good land use carried as advertisements by local businesses, and containing many fine articles on conservation, forestry, and kindred subjects. The Delta Electric Power Association and all of the banks of Greenwood participated in a dinner in honor of Dr. Buie. The *Delta Farm Press* of Clarksdale, Miss., featured the event by a two-page spread, illustrated with pictures of diversified farming. This spread was sponsored by the three banks in Greenwood.

This steep land 12 years ago was planted to kudzu. When pastures dry up during summer droughts, Alderman's livestock finds grazing here.

Yes, we recommend that other communities put emphasis on wise land use.

IRRIGATION IN SIX WESTERN STATES

By A. E. McCLYMONDS

Land leveling on O. McKelvie-Harold Briggs farm near Clay Center, Nebr. SCS worked on plan and techniques with the Clay County Soil Conservation District. Private contractors were hired to do the job.

IN its 15½ years of existence up to January 1, 1951—a year ago—the Soil Conservation Service helped soil conservation district cooperators bring almost 588,000 acres of new land under irrigation in the Northern Great Plains States—Kansas, Nebraska, the Dakotas, Montana, and Wyoming.

In addition, the Service helped improve the irrigation systems on 456,000 acres that already were under irrigation, in order to conserve soil fertility and water. District cooperators received technical assistance on work involving over a million acres of irrigated land.

More than 340,000 acres of the newly irrigated land were developed as parts of individual soil and water conservation plans. The rest—247,000 acres—was developed as "group facilities," where several farmers and ranchers worked together.

Figures on the new land brought under irrigation, by States, up to January 1, 1951, follow:

State	Individual Conservation Plans	Group Facilities	Total
	Acres	*Acres*	*Acres*
Kansas	43,216	———	43,216
Montana	61,799	192,597	254,396
Nebraska	194,537	———	194,537
North Dakota	2,067	———	2,067
South Dakota	6,994	7,776	14,770
Wyoming	31,667	46,941	78,608

These figures are exclusive of land developed under the Case-Wheeler projects, where nearly

Note.—The author is regional director, Soil Conservation Service, Lincoln, Nebr.

30,000 acres had been brought under irrigation. In these projects, the Service developed the land, established the irrigated farm units, and sold them. The Bureau of Reclamation developed the irrigation water supply and the main canals and laterals to distribute the water.

Full impact of this new irrigation development on the productive capacity of the region—especially important now because of the defense program—is not told in those figures, however. It is important, of course, in enabling the land to produce more. But some of it influences the use of thousands of acres of range land, facilitating this land's management for the conservation of soil and water and the greatest sustained projection.

Ted Butterfield's ranch near Beulah, Wyo., is an example. Butterfield is one of the supervisors of the Red Water Soil Conservation District. Irrigation of alfalfa with water from a spring and a small creek has doubled the hay yield and rid him of a winter-feed bugaboo. Service technicians helped him develop the water supply, as well as the irrigation system.

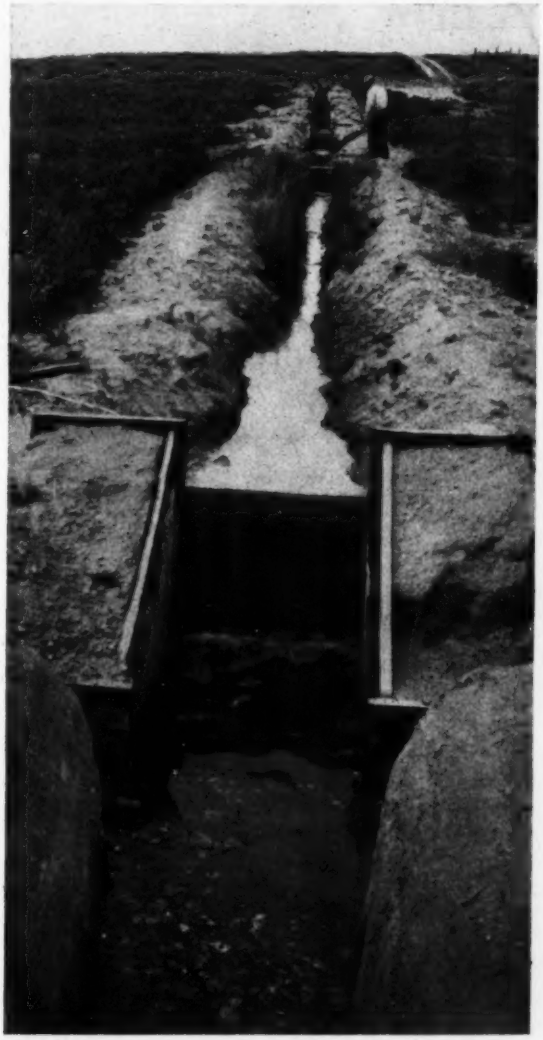
With his increased feed supplies, and the seeding of cool-season grasses for early spring grazing, he is able to defer grazing of the native range each spring until the grasses have made a vigorous growth. He also follows other range-improvement practices, among them being better cover for the land, conservation of more water, and better grazing.

Inasmuch as nearly all of this new irrigation is on small farm and ranch developments, and enterprises involving two, three, or four individuals working together, considerable ingenuity has had to be shown by the technicians in aiding the district cooperators.

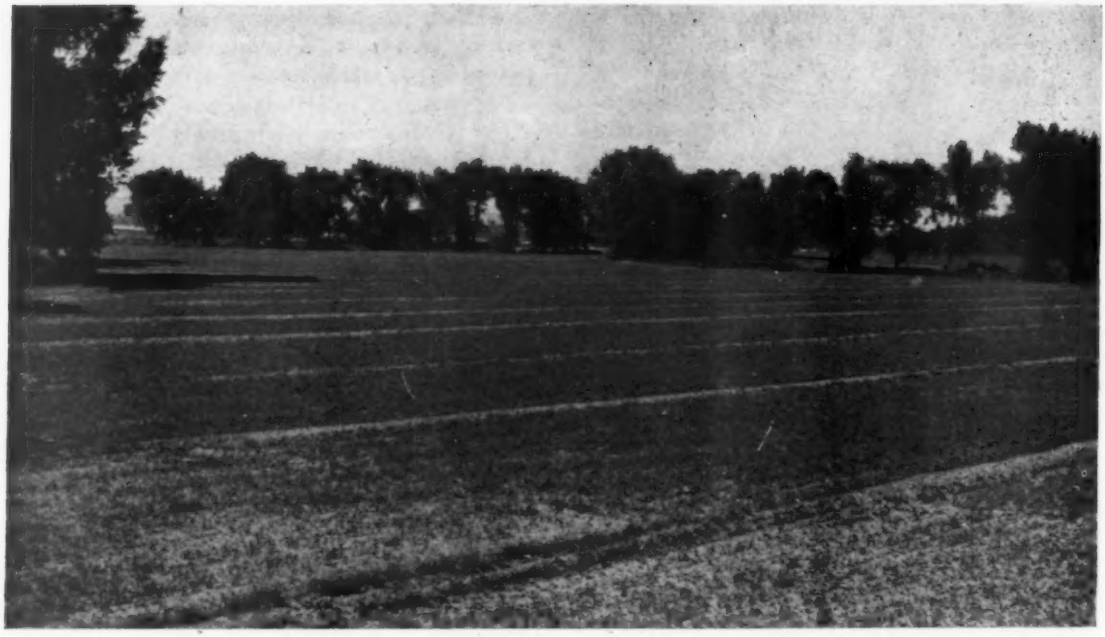
It has been pretty much a case of making use of irrigation water wherever found, provided it is near land suitable for irrigation. The developments include such things as using water from springs, from small streams whose flow is actually too small for irrigation, pumping from wells and open water, making present available water supplies serve more land, aiding State agencies assisting groups with larger enterprises.

Actually, the water supplies, as well as the land, had to be developed for about four-fifths of the new land brought under irrigation. The rest is land that was already under irrigation systems, but which could not be irrigated either because the water supply was insufficient under the irrigation methods then in use, or because the land could not previously be reached due to improper design of the system.

One of the smaller developments is on the Ralph Slemen farm in the Mineral County Soil Conservation District in western Montana. Here the SCS technicians designed a storage dam to take the flow of a stream that is too small for successful irrigation by merely diverting the water. The stream



This drop structure on the R. E. MacLeod farm near Torrington, Wyo., illustrates how it is possible to control the speed of water being brought from the supply canal at the top of a grade down to the land to be irrigated.



Glimpse of land under improved irrigation on farm of Dr. E. A. Hodges, in the Yellowstone County Soil Conservation District, near Billings, Mont. Like so many of the irrigation developments in which SCS has aided farmers and ranchers, this farm is devoted principally to the production of feed for livestock, and as a result it has a decided influence on the management of an extensive amount of dry-land range.

lacks enough head, or volume, at the turn-out gate, and it goes almost dry in summer.

By storing the water, enough volume is accumulated to give Slemen's alfalfa a good wetting in spring and a second irrigation later on in the year to assure a second cutting.

Not far away, near Alberton, in the same soil conservation district, is one of the most unusual developments. It is on the Fred Thompson farm, which consists of about 70 acres of bottom land and some land on the steep mountainside above. Many years ago, Thompson's father had stored the flow from one of the mountainside springs in a catch basin and had irrigated a little less than half of the land.

Aided by specifications provided by the Soil Conservation Service, Thompson now pipes the water from two springs up the mountainside into a sprinkler irrigation system on the bottom land, nearly all of which is now irrigated. Thus, Thompson now has a sprinkler system with the water pressure supplied by gravity. It can be operated 24 hours a day.

Much of the new land brought under irrigation had previously been dry farmed, and some had never been farmed at all.

One of the former is the M. M. Snyder farm near Hastings, Nebr., in the Adams Soil Conservation District. The Soil Conservation Service made a detailed map of the farm, selected the proper place for an irrigation well, and supplied the technical services for leveling 40 acres. Gated pipe is used for irrigation.

"Two years ago, this place was dry-land farmed," Snyder said last fall. "Today all but 10 acres are irrigated."

Mark Watson of Glasgow, Mont., cooperating with the Nashua Soil Conservation District, is one who is bringing under irrigation land that had not been cropped before. Instead, most of the 150 acres he now irrigates was formerly low-producing range, having much sagebrush and little grass.

Water is pumped from the Milk River. Location of the pump, design of the farm lay-out, and technical phases in the development of the land for irrigation were handled by the Soil Conservation Service.

Otto Geeseka near Scott City, Kans., by improving his irrigation system and properly preparing his land for distribution of water, increased by one-fourth the irrigable area of his farm. He is a coop-

erator with the Scott Soil Conservation District. In addition, the improvement made it possible to irrigate better, more rapidly, and with less water. Geeseka gets his water from wells and can increase the amount pumped at will.

Not so with Roy Taylor, near Mountain View, Wyo., cooperating with the Bridger Valley Soil Conservation District, who depends on irrigation for his hay supply. At the time he sought aid from SCS through the district, he was irrigating all the land he could with his available water supply, which comes from a stream.

As a result of redesigning the irrigation system and improving irrigation methods, Taylor now irrigates more land than he could before. There also has been a decided improvement in the grasses in the meadows.

Not only is Taylor getting better hay and more hay from the land he previously irrigated, but he also is getting production from land that didn't produce before because of the lack of irrigation. The hay is Taylor's principal winter feed supply, and the amount he can raise has a big influence on his year-round cattle operations.

In the case of Chris Ohmstede near Guide Rock, Nebr., in the Webster Soil Conservation District, SCS technicians helped enlarge an irrigation system, supplied by impounded runoff, that was built in 1931. First, they surveyed the drainage area to determine the water-storage possibilities and designed an enlarged dam to meet the situation. Then, they designed an improved irrigation system to serve both the land already irrigated and the new land brought under irrigation.

Work in improving existing irrigation systems has included better and more uniform distribution of water, installation of structures to prevent erosion by irrigation water, new flumes, and new turnout gates to deliver water to the fields at the right places and in the right amounts.

One of the farms on which improvement was made of an existing irrigation system is that of W. W. Thompson, near Belle Fourche, S. Dak. Thompson is in the Boyd Soil Conservation District. He reports that where formerly he needed a number of irrigation ditches in each field, and still did not get good distribution of the water, he now gets uniform irrigation with only one or two ditches per field. More than that, he finds that irrigation is much easier and erosion is no longer a problem.

Altogether, the aid given to irrigation farmers and ranchers involved technical services in leveling 270,000 acres, lining half a mile of ditch, developing 2,460 irrigation wells, installing 23,055 irrigation structures and 1,509 surface-water pumps, building 13,830 miles of irrigation supply and field ditches and 2,463 irrigation dams, and improving the irrigation methods on nearly 750,000 acres.

The demand on soil conservation districts for the aid of the Service in soil and water conservation and development of water resources has continued to increase from year to year. The work done in 1950 was about one-sixth of the total amount that has been done in all 15½ years.

One thing in particular marks all of these irrigation operations. They are all founded on an analysis of the capability of the land—that is, its suitability for use under irrigation. Land capabilities are the first thing to be determined in developing a complete, coordinated soil and water plan for a farm or ranch unit.

POSED AT MEMPHIS.—Immediately after becoming Chief of the Soil Conservation Service, Dr. Robert M. Salter attended the national convention of the Soil Conservation Society of America, held at Memphis, Tenn., in the fall. There he met or renewed acquaintance with conservation leaders from many parts of the country.

In this photograph Salter is seen with some of his SCS staff. Seated at his left, hands clasped, is his deputy chief, J. C. Dykes. Standing, left to right, are A. L. Patrick, regional director, Upper Darby, Pa.; T. S. Buie, regional director, Spartanburg, S. C.; E. H. Graham, assistant chief; E. A. Norton, assistant chief; and R. H. Musser, regional director, Milwaukee, Wis.

A profile, "Bob Salter: A Friendly Man of the Soil," appeared in our February issue.

HOW A TEXAS DISTRICT RIDES HERD ON FLOODWATERS

Hon. Sam Rayburn speaks on flood control.

By JOHN H. JOHNSON

FARMERS of the Collin County Soil Conservation District, in northeast Texas, are proud of their part in helping to control floods on the Trinity River watershed. So they invited everyone to see what has been done on their land and to hear about the value of flood measures to all of us.

Part of the celebration was a motorcar tour of the eight detention structures that have been built on Honey Creek, tributary of Trinity River's East Fork. Two more such structures will be built on Honey Creek. In all, 27 detention structures are planned for the East Fork above Lavon Reservoir, which the Army Engineers are building downstream just north of Dallas. The detention structures tie in with the big reservoir.

Technicians of the Soil Conservation Service select sites, design detention structures, and supervise their building by private contractors. Included in the flood-control program are drop inlets, sedimentation basins, floodways, terracing, diversions, farm ponds, and other engineering features. These mechanical measures complement such vegetative features as the seeding of grasses and legumes on fields taken out of cultivation, the development of cover and soil-improving crops, the installation of conservation crop rotations, and the restocking of farm woodlands. All the work is carried on by direction of soil conservation districts. Underlying the program is the principle of using and treating the land to achieve both safe and permanent production.

After the tour there was a barbecue. Principal speakers were Sam Rayburn, Speaker of the House of Representatives, and J. C. Dykes, deputy chief of the Soil Conservation Service. Speaker Rayburn has a farm nearby. Part of the program was broadcast nationally.

"I have always said," Speaker Rayburn told his large audience, "that I would not like to own a bottom-land farm because it floods so much. But this afternoon I saw bottom land that will never

Note.—The author is district conservationist, Soil Conservation Service, McKinney, Tex.

Board of supervisors of Collin County Soil Conservation District: Chester Loughlin, Howard Logan, C. E. Cantrell, John D. Wells, and Chairman Arlus L. Gambrell.

flood again. That land will produce well and dependably. It will do this locality good. It will do the country good."

Dykes told of the work done by Speaker Rayburn and Roland Boyd on legislation to authorize the Honey Creek work which the crowd had seen during the tour.

Dykes called attention to the costly floods which in the past 5 years have inflicted more than 3 billion dollars in damage to crops, land, and other resources.

"Those bottom lands, like the ones you see around here, are our best lands, our most productive," said Dykes. "We can't afford to have them damaged. We've got to do this job of flood control now to avoid the necessity of having to do a bigger and more costly job later.

"We know that we can control small floods and reduce big ones. Land treatment alone is not enough. Upstream work alone is not enough. Neither are dams and levees on the main stems. We must have both together."

Dykes estimated that the Honey Creek program would bring benefits of $7.12 for each $1 of cost. And the East Fork program above Lavon Reservoir would bring $10.12 in benefits for $1 of cost.

The people of the Collin County Soil Conservation District, and those of other districts of the Trinity watershed, have seen the wisdom of getting together to prevent future large disasters from rampant waters.

POND SAVED SITUATION. — In midsummer, 1951, 5 years after he had built his farm pond as an auxiliary source for water for cattle, T. P. Gray, Pursley Creek farmer in the Upper Ohio Soil Conservation District, W. Va., figured that he had a "white elephant" on his hands.

When Gray inspected his herd late in September, he found that the springs from which the animals drank had gone dry—the first time in years. On shifting his cattle to the farm with the pond, they rushed in and began to drink; obviously, they had been without water for a long time.

Lacking the pond, Gray would have had to buy water and pay for having it hauled, or else he would have had to move the cattle to a rented pasture containing water, or put them on the market at once at a financial loss. From any angle, the value of the pond investment was proved. There is no more talk of its being a "white elephant." Lately Gray has stocked it with fish, so that he also will have recreational advantages.

DEEP PLOWING IN ITALY

By GROVER KINZY

THE Italian practice of deep plowing, 1 meter deep, is so different from American practice that it arouses comment, wonder, and a desire to know what results it produces. The hypercritical observer should be warned that this, like many other "peculiar" practices, comes from a nation whose agriculture was over 2,000 years old when Squanto flopped the first fish in a New England hill of corn.

Deep plowing has been observed on very shallow limestone land underlaid with a soft but impenetrable-to-water limestone called in Italy "tufa," which can be pulverized soon after plowing. It also occurs on alluvial sandy soil underlaid at 1 to 2 feet with a 2- to 4-inch layer of iron conglomerate—a soil similar to the Leon or St. Johns in the United States. Again, it is seen on heavy red clay land both on the slopes and in the valley where soil from the slopes has accumulated, and on alluvial gravelly slopes and bottoms, and on loamy-sand or sandy-loam bottoms being reclaimed. In these instances, the land has been plowed a meter deep with an immense plow pulled by one or more heavy crawler-type tractors or by two steam engines using a cable. This is known as the Fowler system, said to have been introduced from England.

In other instances, I have seen much land being worked by hand 30 to 36 inches deep, the stone and stumps being removed in the process but the fundamental purpose being to loosen the soil. No particular attention is paid to keeping the topsoil on top during such operations.

Obviously, in the first two cases results should be beneficial. The soft limestone is of volcanic origin and rich in minerals. The soil body is permanently deepened and about the only loss is a little organic matter. However, some operators prefer scarification a meter deep to plowing. Some scarify only one way; others also cross-scarify. Teeth about 18

Note.—The author was formerly zone technician, Soil Conservation Service, Northeast Region, Upper Darby, Pa. Kinzy in 1951 completed 2 years with ECA in Italy, where he served as agronomist on various agricultural projects.

inches apart are used. The cost of two-way scarification is greater than that of plowing. Breaking and removing the impenetrable iron layer from soils underlaid with it allows plant roots and moisture to penetrate. No large amount of organic matter is buried, as these soils have not produced much in recent years.

Red clays and alluvial, colluvial gravel soils are deep-plowed to loosen them up for better aeration and drainage and there is considerable feeling that exposing subsoil and parent material to the sun makes soil of it rapidly. Some operators turn the clays when dry and leave them exposed for about 3 months, then replow. They seem to feel that it is unnecessary to plow so deep as at first; obviously, the topsoil is left buried. There seems to be no recognition of the value of topsoil. The main idea is to make a deep, loose soil body, then manure it until it is productive. This principle is taught in the colleges and is tied in with keeping more and more livestock so as to have more and more manure to enrich the soil and increase production. Some proponents say land should be deep-tilled every 6 to 10 years. This is done on some small holdings, but usually deep plowing is confined to new land—land cleared of brush and some trees, and rock, or land formerly used for pasture. Around Rome, however, some land that has been cultivated for ages is finally deep-plowed. This is to remove the "tufa" rock and get a deeper soil body, as discussed previously.

The recommended practice for preparing land for fruit trees or vineyards is to trench the row site a meter deep and a meter wide, put a foot of stone in the bottom of the trench, unless the land is sandy or gravelly, then a foot of manure, then fill the trench as the tree is set. This work is always done by hand and is often subsidized by the government under an unemployment law for the benefit of seasonal farm laborers. The practice is said by farm advisers to pay for itself in 7 years in increased production; comparison of neighboring orchards and vineyards where this treatment has and has not been applied supports the statement. The farm advisers are getting many of these new plantings across the slope on grade. Sometimes the grade is an accurate 1 percent, but more often it is just across the slope, more attention being paid to even-width rows than to a definite grade.

The deep-tillage practice is largely confined to new lands, as noted already. The usual farm practice is to plow about 12 inches deep on the better farms and 4 to 6 inches where plowing is done with one span of oxen or a light team and a plow.

In considering the merits of deep tillage, the fundamental Italian and American conditions must be considered. In America, it probably would not pay to remove the iron layer from Leon and St. Johns soils. In Italy the removal adds to the needed acreage of productive land. In America it would cost too much to trench, stone-drain, and deep-manure trees and vines. Land would be used for these crops that did not require such practices or we would try for the same effect by terracing and green-manuring. American subsoiling and deep-tillage experiments have indicated that such methods are not effective, that in a few years the subsoil condition is the same as before. Have we conclusively proved this? It would at least be interesting to run some Leonardtown soil a meter deep, expose it for a season, and then bring it into production. The same would be true for Aura and other soils with a layer impenetrable to air, water, and roots.

EDITORS HONOR BENNETT. — Dr. Hugh H. Bennett, center, former Chief of the Soil Conservation Service, and now Special Assistant to the Secretary of Agriculture, receives the 1951 Distinguished Service Award presented in November by the American Agricultural Editors Association. The award was presented by Ferdie Deering, right, editor of the *Farmer Stockman*. Deering is immediate past president of the AAEA. At left is C. L. "Cap" Mast, editor of *Agricultural Leaders Digest* and executive secretary of the Editors Association.

Dr. Bennett was chosen from among many candidates nominated for the honor.

YOUNG HAWAIIANS SHOW HOW TO COPE WITH KONA STORMS

By NORMAN K. CARLSON

"WHICH is heavier, a bucket of wet soil without humus or a bucket of wet soil with lots of humus?"

Richard Diorec considered the question carefully and then replied, "I don't know which is heavier but I know that the soil with lots of humus will grow the most crops, won't wash away, and will hold the water."

With this final question and reply, he and his team mate won the agricultural demonstration contest at the twenty-first annual meeting of the Hawaii Future Farmers of America.

Richard Diorec, a Hawaiian-Filipino boy, and James Muramoto, a Japanese-American boy, were juniors at the Molokai High School, Territory of Hawaii. Their agricultural education was under the able leadership of Robert Fukuda and Erle Parker. Fukuda and Parker had taught the boys what happens to soil that is not used properly.

Back of the high school's new dairy barn there is a small pasture that has been terraced, grazed in rotation, and never loses any soil. The school has about 30 acres of corn and last year it was planted on the cross slope and very little soil was lost.

There had been no rain of any appreciable amount on Molokai for 10 months. The rains came in January 1950 and it was a very wet month. Richard and James could see from the high school the results of poor land use. The sea was colored red with thousands of tons of rich Molokai topsoil. Their school pasture hadn't lost any soil and the cornland had lost very little. They were primed for their demonstration on erosion.

Here is part of the talk by Richard and James, entitled "Land Uses and Water Erosion."

"We have filled our first two demonstration boxes with ordinary topsoil from a garden. We made contour furrows in this box to show you some of the good effects as well as the dangers of plowing steep land, even if it is farmed on a contour. In the last two boxes we have placed sod and built a miniature forest. The soil in these boxes has already been saturated in order to produce quickly the effect of continued heavy rain. As we sprinkle these plots, the water will be applied faster than it falls in a normal rain, but not so rapidly as it often comes in one of our driving Kona storms." (The normal winds in the islands are from the northeast which are called trade winds. Once or twice each year the winds come in from the south, bringing heavy rains. These are called Kona winds and Kona storms. Kona means "south.")

"If we lift the back of this 40-inch box 1 inch, we have made a 1 to 40 or a 2½-percent slope. If the soil is loose and porous and not already saturated, most of the water from a normal rain will be absorbed, but when a driving rain occurs, there will be some washing, even with this gentle slope. If very much of the land in a field is steeper than 2½ percent, ordinary up-and-down farming will cause a lot of topsoil to wash away.

"Adding another inch changes this box to a 5-percent slope (2 to 40). We have only doubled the slope; yet the same amount of water, applied the same way, will more than double the amount of soil lost. Land as steep or slightly steeper than this can be farmed successfully, year after year, if it is laid out properly with some type of contour farming. It will do quite well planted to a grain crop if we either leave the stubble and straw on the ground, or plant fall grain or some type of cover crop to protect the soil during the rainy winter season. If cultivated rows were made up and down the slope, the erosion would be much worse than it is with the land smooth.

"By doubling the slope again and making it 10 percent (4 to 40), we once more reduce the amount of water absorbed and again more than double the amount of soil lost. This is true because water that is moving rapidly carries soil particles much easier than if it were moving slowly. Land this steep or steeper can be used for cultivated crops only by a carefully laid out contour method of farming.

"If it is used for grain, the soil loss, at times, will be excessive; while row crops, running with the

Note.—The author, now on military duty, wrote this while working as work unit conservationist, Soil Conservation Service, Kaunakakai, Molokai, T. H.

Richard Dioree (left) and James Muramoto with demonstration equipment: water can, boxes of simulated land and cover, jars to show color of water discharge.

slope, will carry away tons of good topsoil in every heavy rain.

"By adding another 2 inches, we change this to a 15-percent slope (6 to 40). This is nearly the extreme limit of land that should be plowed for cultivation. The muddy water running off at the bottom of this box explains quite fully why so many large farming areas in the United States have been almost entirely ruined in the last hundred years. Land this steep should be used primarily for hay crops or something of a similar nature which protects the soil. If it is ever used for cultivated crops, we must practice not only careful crop rotation, but also intensive soil conservation treatments such as strip cropping, trashy fallow, mulches, carefully laid contour ditches, and drainage channels to carry off surplus water. The erosion on steep land is worse on long hills since the amount of rain water accumulates as it goes, and the longer the slope the greater the speed of water at the bottom.

"We have made contour furrows and broad-based terraces in the second box, in order to show you that these good farming practices help greatly in holding back the water that would run off if they were not there. On porous, fertile soil, in an ordinary rain, practically all of the water will be absorbed and there will be very little soil erosion. However, in a hard, driving rain, or one that continues over a long period of time, the water may begin to break over the contours, unless we have provided drainage ditches to carry off the surplus and distribute it where it will do no harm. If this occurs, the damage may be even greater than if we had no contours at all. We were unable to build drainage ditches at the sides of this box, so the effects of broken contours are quite evident.

"The third box we have filled with sod so as to make it as nearly as possible like good pasture land. We will deliberately make this a 30-percent (12 to 40) slope, which is nearly twice as steep as land that should ever be plowed. In spite of the fact that these sods have only recently been cut and placed in this box and that there is some loose dirt, you will notice that the water which runs off at the bottom of this box is almost clear. If contour furrows are made in a steep pasture and the banks are well sodded, practically all of the water will be held, to soak into the soil, even in a hard, driving rain.

"If we avoid overgrazing and trampled spots, there will be almost no erosion on good pasture land, even if the slope is much greater than 30 percent. By adding another 8 inches to the back of this plot we make it a 50-percent slope (20 to 40), and still there is a comparatively small loss of soil. However, in spite of the fact that the grass tends to hold back the water, a great deal of it runs off from the steep slopes and carries with it the plant foods on the surface that are easily dissolved. For this reason, it is much better to use terraces or contour furrows on steep pasture land so as to hold the runoff water until it is absorbed.

"In this last box we have created forest conditions, as nearly as possible, by covering the soil

Severe erosion on already saturated pineapple field, caused by 4- to 6-inch rain which fell in about 24 hours in January 1950. The pineapple companies are continually reducing this type of erosion by improved field layout, contouring, trash-mulching, and grassed water-disposal ditches.

with leaves and leafmold and by using branches for trees.

"By adding 18 inches to the back of this box, we make it a 45-percent slope (18 to 40), nearly three times as steep as any land that should ever be plowed. As rain falls in a forest area, the trees, as well as the leaves on the ground, break its driving force and tend to hold back the water, while the leafmold in the topsoil aids greatly in absorption. Small plants generally grow thick enough among the forest trees to protect the soil, but even when there are only a few small plants, there will be very little loss of soil on slopes as steep as this if there is a good covering of leaves and leafmold.

"In areas that are planted to trees, contour ditches or terraces will help a lot in holding the water and preventing erosion, especially during the time that the trees are getting started.

"All too often the owner of a piece of well-protected woodland, feeling that he needs cash to buy a new automobile or a piece of machinery, will cut and sell all of his timber at one time instead of harvesting it over a period of years. Within a few months the loose leaves will blow away and much of the leafmold will disappear.

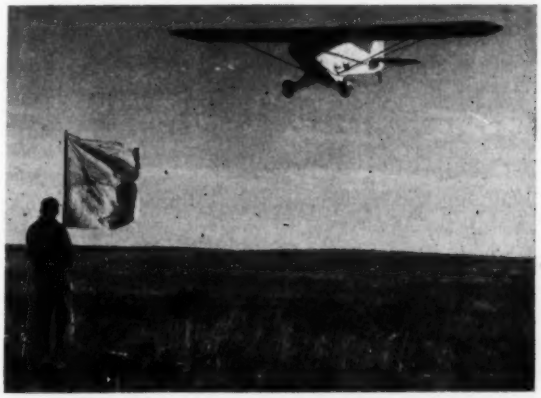
"When the spring rains come, the thin layer of humus and topsoil which has been slowly accumulating under forest conditions may be washed down to bury the good cropland below, leaving behind a bare, rocky, gullied, and worthless hillside.

"Land as steep or steeper than this should be used for pasture land only when grazing and trampling is carefully controlled. Most land this steep or steeper should be used principally for watershed, game refuge, or recreational areas. When timber is cut from steep areas, only scattered trees should be cut at one time, so that the soil is never left bare and unprotected.

"You have seen the disastrous loss of soil which may occur when steep land that should have remained in pastures or forest is plowed and cultivated. The value of good contour farming is evident. Scientific information on soil conservation is readily available to everyone. In most cases those who make their living on the land may have the help of specialists for the asking. Common sense and simple devices will often help.

"Unless every American makes it his business to do everything possible to control erosion, it will continue for years to come, leaving behind ruined land, lowered production, and abandoned farms."

SEEDING SAND LOVEGRASS FROM THE AIR



Airplane takes 2½-mile run in seeding sand lovegrass.

By GEORGE S. ATWOOD and LESLIE E. JOHNSON

UP TO 2,000 acres of grass seeding per day is done on the Land Utilization Project in Morton County, Kans., in which the federally owned land is administered by the Soil Conservation Service. A fleet of one-way plows and an airplane cooperate in this work.

In 1938, when the Government began developing the 102,500 acres of federally owned land in the project, there were many unsolved problems involved in large-scale revegetation. Emergency stabilization of drifting sand then took precedence over seeding.

Range reseeding with native grasses was comparatively new, suitable seeding equipment was not available, and seed sources were limited. Grass drills capable of seeding all types of native grasses are largely a product of the last 15 years.

The job in the Morton County LU Project involved not only cropland to be seeded, but also the reseeding of range lands where sand sagebrush, soapweed, and dropseed had replaced the useful native grasses. How to get rid of the brush, and

Note.—The authors are project manager, Soil Conservation Service, Elkhart, Kans., and district conservationist, Soil Conservation Service, Liberal, Kans., respectively.

prepare a seedbed without creating a wind-erosion hazard, presented a knotty problem.

Various types of drills and broadcast seeders were designed and built by the Soil Conservation Service. Experience brought improvements. Implement companies began to enter the field and highly satisfactory machinery gradually evolved.

Reseeding of the range was first tried without preparing a seedbed. Then were tried mowing, railing, and disking, and finally, one-way plowing. While this evolutionary process was going on, the airplane came into use as a means of broadcasting seed.

Longley and Atkins (SOIL CONSERVATION, June 1950, pp. 258-260) described the initial trials with the air seeding of sand lovegrass on the sandy lands of southeast Kansas, in which soil conservation districts and SCS cooperated. Results obtained by air seeding on lands that had been prepared by one-way plowing, coupled with a need for rapid completion of the seeding job on the Morton County LU Project, bring us to the summer of 1950.

A contract for one-way plowing of 15,000 acres of sagebrush-infested lands in the project was awarded at 77 cents an acre. The contractor moved in two crawler-type tractors, each pulling three 9-foot plows. By operating around the clock, he was able to plow 320 acres a day. The depth of plowing was regulated so as to leave three-fourths of the vegetation on top as a surface mulch to eliminate the possibility of soil blowing.

The harvest of sand lovegrass seed needed to sow the big acreage was carried out by the SCS with equipment available on the project, supplemented by contracting the combine-harvesting of 400 acres at $4 per acre. Thirty-eight thousand pounds of sand lovegrass seed were harvested with the project and contract equipment at a cost of about 7.5 cents per pound, not including a land-rental charge. This compared with a price of 40 cents per pound on the commercial market.

The air seeding was done in November and December 1950 on 16,000 acres at 23 cents per acre. The Service furnished the flagman and delivered the seed to the flight strip. The contractor used a small plane, carrying 500 pounds of seed each trip. With this equipment, the seeding was done at an average rate of 2,000 acres per day.

The seed was broadcast on the one-way plowed land at a rate of 2½ pounds per acre.

Flight strips averaged 57 feet wide and the plane was flown at an altitude of 50 to 60 feet, with runs of from ½ mile to 4 miles in length. With the plane making runs of this type and at the altitude flown, it was possible to do the flagging with three or four men. A good pilot can fly a fairly straight line when flagged at each end of the flight.

Preparing and seeding the land by contract methods has resulted in a considerable reduction in the cost per acre. The use of larger equipment for one-way plowing, with lower labor costs per unit, made this reduction possible. Such SCS equipment as

Nine-foot one-way plows turn sand sagebrush, dropseed, and soapweed (yucca) in preparation for air-seeding sand lovegrass. A trashy mulch remains to help prevent soil blowing. (Photo by Cannon, of Southwest Daily Times.)

was available for one-way plowing consisted only of small crawler-type tractors, each capable of pulling only one 10-foot one-way plow. Distance from project headquarters reduced the actual operating time per day for tractor operators.

The airplane as a seeding machine has obvious advantages over ground equipment on rough sandhill land. The 23-cents-per-acre contract price, plus 2 cents per acre for the ground crew, making a total seeding cost of 25 cents per acre, cannot be approached by ground-seeding methods.

While experience has demonstrated that drilling results in more rapid establishment of uniform stands of sand lovegrass, it is believed that the reduction in seeding costs and the ability to cover large areas in a short time justifies airplane seeding of sand lovegrass.

The lovegrasses, because of their small, round seeds, are peculiarly adapted for this sort of seeding. No effort has been made to seed other kinds of grasses by air on the project. Because of its ability to volunteer readily, lack of a uniform initial stand of lovegrass is not so important as it would be with other grasses which produce seed less prolifically.

"KING" COREY RULES NEW ENGLAND'S VERDANT FIELDS

By HUGH F. EAMES

MANUEL V. COREY, conservation farmer, is king of New England's 3,482 green-pasture builders. He owns Whitehall, one of the area's oldest farms, near Newport, R. I. Berkeley House, his home, is the old White Hall Society house which was built 222 years ago by Dean George Berkeley, British philosopher.

A native of the Azores, Corey came to America 30 years ago and went to work as a nursery laborer at $4 per day. After 6 years, he married, started a family, and began to put aside money to buy the stock and equipment and lease the Frank Nunes, Jr., farm along Wyatt Road, at Middletown, about 5 miles from Newport. That was in 1928.

It was in 1949 that he bought nearby Whitehall from Walter K. Phelps. The conservation survey made for Phelps showed non-stony glacial till soils from slates and similar rocks. Most of it was of medium texture and was well drained, the remainder imperfectly or poorly drained. The land was level and gently rolling. Erosion ranged from slight to moderate, with occasional gullies in one part. One piece of wet land was a prime headache.

While there was a complete conservation plan ready, not much had been done to establish it, beyond improving 14 acres of wet land through 1,900 feet of stream-channel work. This was a big factor in Phelps' winning fourth place in the 1948 Rhode Island green-pasture contest.

These stones came out of the fields at Whitehall Farm. Behind Corey can be glimpsed some of his fine pastures and dairy cows.

At the Nunes farm, Corey's progress in conservation farming had been about like Phelps'. He had the plan but did little with it because it was a tenant farm where he did not expect to remain and did not want to make permanent investment. There the emphasis was on potatoes, with dairying as a side line. He grew corn for silage.

Corey continued the same type of operations at Whitehall until late in 1950, when he asked the

Note.—The author is in current information, Soil Conservation Service, Upper Darby, Pa.

Eastern Rhode Island Soil Conservation District to have a new plan made. With the help of Howard O'Connell, SCS technician; County Agent Herbert Peabody; and Frank Arruda, dairy farmer and PMA county chairman, he began the switch from potatoes and corn to dairying and grassland farming. He eliminated corn for silage, cut down potatoes to 3 acres in 1951, and will have none in 1952. From now on the Corey farm will be an all-grassland operation. There is more profit in using the land for pasture than for potatoes, Manuel finds.

In 1951 Corey established 8 acres of contours, improved 1 acre of pasture, established 20 acres of permanent hay, put 41 acres of pasture under a management program, and seeded 1 acre of pasture.

The well-balanced pasture-hay program is the backbone. There are more than 50 acres of Ladino clover pasture, and 35 acres of alfalfa and red clover in combination with grasses for second and third cuttings of hay. The first cutting serves to fill two silos. The second cutting, started in May, produced 3,200 bales of excellent hay last year. Production of silage and hay is more than he can use on the farm, so some is marketed. That's why Corey is preparing to add 28 milkers to his herd of 44 cows and 28 head of young stock. It is a mixed herd, mostly Holstein, in which a registered sire is used. Last year the average production was 10,567 pounds of milk and 395 pounds of butterfat.

Corey gets top production from his pasture and hay land because he treats it right. He has built it up through spreading as much as 800 pounds of 0-20-20 fertilizer per acre. He is dropping back to an average 600 pounds next time. He fertilizes in the spring and again in the fall, 600 pounds of fertilizer being the smallest amount used in any of his fields. This year he will spread the same amount of application over three periods.

Starting in April and running through September, Corey gets five to six feedings each season through pasture rotations. This is supplemented by grain feeding, at the rate of 1 pound to 6 pounds of milk. In 1952 he is reducing the ratio to 1 to 8 pounds of milk produced.

In his seeding program Corey had difficulties with narrow-leaf plantain. As a result, he is changing his methods so that the soil will be cultivated for at least 1 year before seeding. He plans to plant oats in the spring and follow with Sudangrass. Hay-seed mixtures or pasture mixtures will be planted the following spring. Corey noted that he had the best catch, with the least amount of weeds, on a field that had been planted to potatoes for several years.

Operations at Whitehall are strictly a family affair. Mrs. Corey, also born in the Azores, keeps all the books. Manuel Corey, Jr., at 23, is herdsman and understudy for his dad. Other children, each active in helping make the farm successful, are Mary, 24; Alice, 16; Edward, 13. A nephew, Frank G. Sylvia, 2 years in this country from the Azores, is the only full-time farm helper.

Manuel V. Corey became king of New England's 1951 green-pasture builders in six States solely on his 87-acre operations at Whitehall. Additionally, he farms more than 60 acres under lease.

Two of the three All-New England prize winners, and 15 of the 18 first-, second-, and third-place State winners, are soil conservation district farmers.

Conservation farmers swept all three places in Vermont, Maine, Rhode Island, and New Hampshire. They won first and second honors in Massachusetts, and third place in Connecticut. Of Vermont's 42 prize winners, 38 are district farmers.

EDWIN W. GOPLEN—CONSERVATIONIST.—At the 1951 Minnesota State Fair, Edwin W. Goplen, Zumbrota, Minn., farmer, and chairman of the board of supervisors of the South Goodhue Soil Conservation District, received a $150 award from the Firestone Tire and Rubber Co. of Akron, Ohio. The award was in recognition of Goplen's efforts in promoting soil conservation through the use of an airplane.

Goplen got started in soil conservation in March 1935 on signing a cooperative agreement with the Zumbrota CCC camp calling for almost a complete rejuvenation of his 160-acre farm. Terraces were constructed, contour strips laid out, gullies healed by masonry structures. A 6-acre wood lot was planted to trees, and several smaller areas aggregating 3½ acres were improved for wildlife. Goplen's name since then has become synonymous with the conservation of soil and wildlife throughout Minnesota.

In 1936 Goplen was appointed to the board of the Zumbro Valley Soil Conservation Association, and in 1937 he was instrumental in getting the Minnesota Soil Conservation Districts Law passed by the legislature.

The South Goodhue Soil Conservation District was organized in September of 1942, and Goplen was one of the two supervisors appointed by the State Soil Conservation Committee to serve on the five-man board of supervisors. He still holds this office although it has become elective rather than appointive.

Edwin W. Goplin (right) accepts award from Kenneth C. Butler, president of Minnesota Flying Farmers.

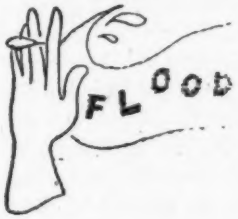
He was president of the Zumbrota Chapter of the Izaak Walton League of America for 2 years, and in 1948 was chosen as one of the four outstanding farmer-sportsmen in Minnesota who had accomplished the most for wildlife conservation during that year. In 1950 he was selected as chairman of the land-use committee at the State convention of the league and has influenced this body in no little way in its recognition of the importance of soil and water to wildlife conservation.

In 1949 the legislature added two farmers to the State Soil Conservation Committee and Edwin W. Goplen was unanimously selected as one of these members.

The rewards Goplen has received have served only as an added incentive to accept more responsibilities in the promotion of soil, water, and wildlife conservation.

—ROBERT ANDERSON

WORK AT WATKINS GLEN.—Through the work of the Schuyler County Soil Conservation District in coordinating the efforts of town, State, and Federal agencies, New York State's famed Watkins Glen at last will be protected from flood damage. The Soil Conservation Service is providing technical services for construction of a storage dam 14 feet high and 800 feet long. It is designed to hold back the water from a 2½-inch rainfall, such as caused tremendous damage in the Glen area last spring. At flood stage the water will cover 4 acres and have a depth of 12 feet. Normal size of the pond will be 1 acre, 3 feet deep. Flood waters will be released gradually through a 12-inch outlet.



CHRISTMAS TREE SALES.—District farmers in Michigan enjoyed estimated sales of 750,000 Christmas trees during the last yule season. Prices varied from 50 cents to $1.50 per tree on the stump. Most of them were produced by district farmers in the counties of Grand Traverse, Mason, Muskegon, Ottawa, Kent, and Livingston.

REVIEWS

FUNDAMENTALS OF SOIL SCIENCE. By C. E. Millar and L. M. Turk. Second Edition. 484 pp. Illustrated. 1951. New York: John Wiley and Sons. $5.50.

Soil science has come a long way since Lawes and Gilbert laid out their plot experiments at Rothamsted in 1843. Several hundred research workers are seeking answers to questions about why our soils behave as they do. These workers use some of the methods of atomic physics; they make X-ray photographs; they juggle electrons; they use modern equipment for chemical analysis; and they

still use, along with these and other methods, the time-honored techniques of careful observation and precise description. Since soil science is truly a science, they also put together facts and ideas to give us improved concepts about the nature of this essential stuff. Their researches fill two specialized scientific journals in the United States, many technical bulletins, and hundreds of other scientific papers published all over the world. The writer of a textbook on soils draws from this mass of literature plus his experiences, and must choose his subject matter with care.

This book is the second edition of one that first appeared in 1943. The general outline is much like that of the first edition. A chapter of 33 pages on soil conservation has been added, and two short, specialized chapters on fruit soils and lawn soils have been omitted. The first three chapters of the earlier edition have been rearranged into five, and the entire text has been considerably revised and expanded. The result is a book that is valuable both to the college student who is beginning the study of soils and to the professional worker who studied soils some years ago and wants to brush up.

The book lives up to its title explicitly. It is an exposition of fundamentals, not a handbook of applied soil science. You find in it a good discussion of soil acidity, but no directions about how to make a particular pH test and decide how much lime to put on. The significance of the pH scale is explained, however; and all that is as it should be in a textbook of this kind. You find mention of the rapid diagnostic tests for nutrients in soils, but no information about specific tests and how to make them. That also is as it should be, for in college such subjects must be covered in advanced courses. The modest statement that interpretation of such tests is difficult and should be attempted only by experienced persons might well be memorized by soil conservationists and all who deal with farmers and gardeners.

Outstanding parts of the book are those dealing with soil organisms, organic matter, cover and green-manure crops, and farm manures. In some of the other chapters the explanations could be improved. A better concept of soils would be given, for example, by a little less emphasis on the separates of mechanical analysis and more on the concept of a continuous size-distribution curve as the usual occurrence; by a discussion of the energy concept of soil moisture and the relation of moisture tension to the arbitrary divisions into gravitational, capillary, and hygroscopic water; and by some additional discussion of the variations that are tolerated, as well as the homogeneity that is required, within a soil-mapping unit such as a soil type. Some facts about different clay minerals would help us understand why some soils shrink more than others when they dry out, and why soils differ in such properties as erodibility and base exchange capacity.

Paper and typography are better than in the wartime edition of 1943. Readability is about what we would expect in a college text: Reasonably good, but could be improved in some places without damaging the subject matter. The book is not one that will keep you awake nights, but it is packed with sound information about soils. If you don't have one of the standard texts on soils in an edition printed within the last 10 years, you will find it well worth your while to take a good look at this one.

—J. G. STEELE.

THE 4-H STORY. By Franklin M. Reck. 294 pp. Illustrated. 1951. Ames, Iowa: The Iowa State College Press. $3.

This is a history of 4-H Club work arranged for by a committee of the Cooperative Extension Service and published and distributed by the National Committee on Boys and Girls Club Work. The story covers a period of more than 40 years, recounting details of the youth phases of the Extension program, in which an estimated 15,000,000 boys and girls have taken part and in which some 2,000,000 are now enrolled annually.

Although much research was done in order to have accurate and complete information, there are admittedly many gaps which leave an opportunity for a more complete story eventually. One is impressed, however, by the fact that it is a most acceptable recording of the facts even though much of the activity occurred a long time ago. The old photographs are of particular interest.

There are chapters which describe the Corn Club dating back to 1904, the Canning Club to 1910, and the national advent of the clover-leaf emblem to 1911. Other interesting chapters are about the National Committee, the early days of the Club Congress, and the National Camp. The chapter

National 4-H Club winners in 1951 soil and water conservation contest: Harry Lee Strouth, Clintwood, Va.; John D. Bane, Burlington, W. Va.; Belden D. Patrick, Woodbine, Md.; Tommy D. Tate, Fairfax, Okla.; Larry L. Neibauer, Lohman, Mont.; Franklin E. Johnson, Valdosta, Ga.; Joseph A. Miller, Vernon, Vt. Kneeling by map—Wilbert K. Glynn, Wykoff, Minn.

"Livestock in the South; Conservation Everywhere" is one with special meaning to those primarily interested in Extension education in soil and water conservation. Boys and girls in large numbers (186,141 in 1950) are getting good information about land care from Extension workers and from volunteer leaders who know the merits of soil and water conservation.

It was a pleasure to receive a copy of this book presented by one of the donors to those attending the thirtieth National 4-H Club Congress in Chicago. Reck also is the author of "Manual for Local Leaders—4-H Soil and Water Conservation Program," which is being used widely in 4-H Club work.

—W. R. TASCHER

THE CONSERVATION OF GROUND WATER. By Harold E. Thomas. 327 pp. 1951. New York-Toronto-London: McGraw-Hill Book Co., Inc. $5.

This book is a survey of the present ground-water situation in the United States, and describes the history and effects of ground-water use throughout the Nation. For engineers, geologists, hydrologists, and others concerned with ground-water supply problems, it provides a summary of available information on the development and use of ground water, and then discusses the experience of some 70 areas in 35 States.

The author of the book, Dr. Harold E. Thomas, is a geologist with the United States Geological Survey and has a wide experience in ground-water supply. The survey was sponsored by The Conservation Foundation, an independent, nonpolitical organization dedicated to the conservation of the earth's life-supporting resources. A committee, composed of Dr. Abel Wolman, of the Johns Hopkins University; Carl G. Paulsen and Dr. A. Nelson Sayre, of the United States Geological Survey; Homer M. Wells, of the United States Soil Conservation Service; and Edward N. Munns, of the United States Forest Service, advised the Foundation in this survey.

The information presented in the book is based upon published reports, unpublished data, and discussions with technical men in various Federal, State, and private agencies studying problems pertaining to ground water. Ground-water problems resulting from pumping, from settlement and use of the land, from irrigation and drainage operations, and disposal of wastes are analyzed. The book also outlines the need for more effective ground-water development and the requirements for better ground-water management in the United States. A series of maps shows the ground-water situation over the country, including areas of overdraft, salt-water intrusion, and other pertinent aspects.

Ground water is a natural resource upon which a large part of our population depends. It supplies many municipalities and is widely used in agriculture and industry. Thomas calls attention to our increasing requirements for water, current deficiencies and future needs for effective ground-water development, problems of water rights and of regulating ground water, and water-conservation practices. The last chapter of the book by Abel Wolman is devoted to better ground-water management. Excellent data are presented in the appendix on pumpage from 107 major ground-water reservoirs throughout the Nation.

This new book performs several valuable services. It will be an excellent addition to the libraries of those faced with problems of ground-water supply. The selected bibliography of areal ground-water studies given in the appendix should prove useful to research workers as well as practicing engineers.

—HARRY F. BLANEY

U. S. GOVERNMENT PRINTING OFFICE: 1952

TO BE NOTED IN PASSING. — "The public should know that farmers are protecting our heritage in the soil," says Manager Bill Knuth of Firestone Farms, Columbiana, Ohio. Knuth has put up large, attractive signs calling attention to various practices.

It's a common complaint that "We don't see enough soil conservation work." Fast driving may be one reason, but Bill Knuth's signs are actually slowing down tourists on Ohio Routes 7 and 14.

Herman L. Reuter, Lisbon, Ohio, farm planner with the Columbiana Soil Conservation District, assisted with the Firestone conservation farm plan.

DISTRICT CUTS INSURANCE COST.—After 5 years' effort, the Allegany County (N. Y.) Soil Conservation District has contrived a 16 percent total saving amounting to $205 annually in its outlay for compensation insurance. It is a result of getting a special classification set up to cover the time when district workmen are planting trees, and it cuts the cost of coverage during this operation by about 50 percent.

Previously the district paid at the rate of $5.52 under a farm rating which covered the workmen as machinery operators. In tree planting the accident hazard is much lower, and for this type of employment the rate now has been cut to $3.38 as "landscape gardening."

Under the new schedule, compensation rates paid by the district are: Grading of land (machine jobs), $7.249 per $100; surveying, $0.782 per $100; and landscape gardening (tree planting), $3.525 per $100. The district directors are particularly pleased because the cut in rate has been carried back by the State Insurance Fund to cover the 1950 and 1951 policy periods.

A BETTER RISK.—Supervisor John D. Fuqua of the Chipola River (Fla.) Soil Conservation District and Soil Conservation Aid Frank DeBord with the Gadsden Soil Conservation District are members of the State board of directors of the National Farm Credit Association. They showed slides at their Miami meeting and discussed the costs and benefits of improved pasture, pointing out the need for increasing the sum of money to be loaned to an individual for that purpose by the National Farm Loan Association. Fuqua proposed that the association make a ruling that any loan applicant must have either a complete soil and water conservation plan or sign an application for SCS assistance in making one before his loan could be approved. He brought out that carrying out a complete soil and water conservation plan would make the applicant a more sound risk, and that signing an application would be evidence of good intentions on the part of a new applicant and would insure continued improvement on the part of the borrower.

The Florida board of directors voted to have Supervisor Fuqua present the proposal at the national meeting of the directors of the National Farm Credit Association.

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